What is claimed is:

1. A method for propagating a fault notification in a network comprising:

identifying possible points of failure in a network;

forming indicia of each identified possible point of failure;

propagating the indicia of the identified possible points of failure within the network;

storing the indicia of the identified possible points of failure in network nodes; and

determining whether a fault has occurred in the network and when a fault has occurred, propagating a fault notification by at least one of the network nodes that detects the fault to its neighboring network nodes.

2. The method according to claim 1, wherein the network is a label-switching network.

3. The method according to claim 2, wherein label switching is performed in accordance with MPLS.

4. The method according to claim 2, said propagating the fault notification being by an interior gateway protocol (IGP).

5. The method according to claim 2, said propagating the fault notification comprising sending the fault notification by a label switched packet.

6. The method according to claim 5, said label switched packet having fault information label (FIL) that distinguishes the fault notification from data traffic.

7. The method according to claim 6, wherein a substantially same FIL is sent with each fault notification regardless of which network node originates the fault notification.

8. The method according to claim 6, wherein each network node originates fault notifications having a FIL that is unique to the node.

9. The method according to claim 1, said storing the indicia of the identified possible points of failure being performed by network nodes that would be affected by the corresponding point of failure.

10. The method according to claim 9, said network nodes that would be affected by the corresponding point of failure having set up a label-switched path that uses a resource identified by the corresponding point of failure.

11. The method according to claim 1, further comprising recovering from a fault by at least one of the network nodes that receives a fault notification that corresponds to a point of failure that affects operation of the node.

12. The method according to claim 1, wherein the indicia includes a first field for identifying a component of the network and a second field for identifying a sub-component of the component identified in the first field.

13. The method according to claim 12, wherein the indicia includes a third field for identifying a network link coupled to the component identified in the first field.

14. The method according to claim 12, wherein the component of the network identified by the first field includes one of the nodes of the network.

15. The method according to claim 14, wherein the second field includes a mask having a number of bits, each bit corresponding to a sub-element of the node identified by the first field.

16. The method according to claim 13, wherein the third field identifies a logical network link that corresponds to multiple physical network links coupled to the component identified in the first field.

17. The method according to claim 12, wherein the fault notification includes the indicia corresponding to one of the points of failure corresponding to the fault.

18. The method according to claim 1, wherein the fault notification includes the indicia corresponding to at least one of the points of failure corresponding to the fault.

19. The method according to claim 18, wherein when said fault results in multiple points of failure, propagating fault notifications corresponding to each of the multiple points of failure.

20. The method according to claim 1, further comprising propagating indicia of additional possible points of failure in response to changes in the network.

21. The method according to claim 1, said propagating a fault notification comprising communicating the fault notification to a multicast group, the multicast group including network interfaces of the node that detects the fault to its neighbors.

22. The method according to claim 21, further comprising propagating the fault notification from the neighboring nodes to each other node in the network.

23. The method according to claim 22, said propagating the fault notification from the neighboring nodes being via multicast trees stored in label-swapping tables of each node in the network.

24. The method according to claim 1, said forming being performed by network nodes associated with the corresponding possible point of failure.

25. A system for propagating a fault notification in a network comprising a plurality of interconnected network nodes, each having stored indicia of identified possible points of failure in the network and wherein, when a fault occurs in the network, at least one of the network nodes that detects the fault propagates a fault notification by to its neighboring network nodes, each neighboring node having a multicast distribution list for distributing the fault notification throughout the network.

26. The system according to claim 25, wherein the network is a label-switching network.

27. The system according to claim 26, wherein the fault notification is distributed via label-switched paths.

28. The system according to claim 27, the label-switched paths being identified by fault information labels (FILs) included in the multicast distribution trees.

29. The system according to claim 28, the fault notification including the indicia corresponding to the fault.

30. The system according to claim 29, wherein the indicia includes a first field for identifying a component of the network and a second field for identifying a sub-component of the component identified in the first field.

31. The system according to claim 30, wherein the second field includes a mask having a number of bits, each bit corresponding to a sub-element of the node identified by the first field.